



# Test Report: GS120A15

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120W AC-DC Single Output Desktop

## ■ DESIGN VERIFY TEST

Output Function Test

Input Function Test

Protection Function Test

Component Stress Test

## ■ SAFETY & E.M.C. TEST

Safety Test

E.M.C. Test

## ■ RELIABILITY TEST

ENVIRONMENT TEST

**DESIGN VERIFY TEST**
**OUTPUT FUNCTION TEST\*-**

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	RIPPLE & NOISE	V1 : 180 mVp-p (Max)	I/P : 230VAC O/P : FULL LOAD Ta : 25°C	V1 : 51 mVp-p (Max)	P
2	OUTPUT VOLTAGE TOLERANCE	V1 : 5%~ -5% (Max)	I/P : 100 VAC / 264 VAC O/P : FULL/ MIN LOAD Ta : 25°C	V1 : 1.5%~ -1.5%	P
3	LINE REGULATION	V1 : 1%~ -1% (Max)	I/P : 100VAC ~ 264 VAC O/P : FULL LOAD Ta : 25°C	V1 : 0.3%~ -0.3%	P
4	LOAD REGULATION	V1 : 5%~ -5% (Max)	I/P : 230 VAC O/P : FULL ~MIN LOAD Ta : 25°C	V1 : 1.5%~ -1.5%	P
5	SET UP TIME	230VAC : 2000 ms (Max) 115VAC : 2500 ms(Max)	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	230VAC/ 306 ms 115VAC/ 612 ms	P
6	RISE TIME	230VAC : 25 ms (Max) 115VAC : 25 ms (Max)	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	230VAC/ 13 ms 115VAC/ 13 ms	P
7	HOLD UP TIME	230VAC : 20 ms (TYP) 115VAC : 20 ms (TYP)	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	230VAC/ 79 ms 115VAC/ 32 ms	P
8	OVER/UNDERSHOOT TEST	< ±5%	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	TEST : < 5%	P
9	DYNAMIC LOAD	V1 : 1500 mVp-p	I/P : 230 VAC (1).O/P : FULL /Min LOAD 90%DUTY/ 1KHZ (2).O/P : FULL /Min LOAD 50%DUTY/ 120HZ Ta : 25°C	(1). 799 mVp-p (2). 1019 mVp-p	P

## INPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	INPUT VOLTAGE RANGE	100VAC~264 VAC	I/P : TESTING O/P : FULL LOAD Ta : 25°C  I/P : LOW-LINE-3V= 97 V HIGH-LINE+15%=300 V O/P : FULL/MIN LOAD ON : 30 Sec . OFF : 30 Sec 10MIN ( AC POWER ON/OFF NO DAMAGE )	70 V~264V  TEST : OK	P
2	INPUT FREQUENCY RANGE	47HZ ~63 HZ NO DAMAGE OSC	I/P : 100 VAC ~ 264 VAC O/P : FULL -MIN LOAD Ta : 25°C	TEST : OK	P
3	POWER FACTOR	0.97 / 230 VAC(TYP) 0.99 / 115 VAC(TYP)	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	PF= 0.977 / 230 VAC PF= 0.998 / 115 VAC	P
4	EFFICIENCY	89 % (TYP)	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	89.01 %	P
5	INPUT CURRENT	230V/ 0.7 A (TYP) 115V/ 1.4 A (TYP)	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	I= 0.51 A/ 230 VAC I= 1.02 A/ 115 VAC	P
6	INRUSH CURRENT	230V/ 70 A (TYP) COLD START	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	I= 39 A/ 230 VAC	P
7	LEAKAGE CURRENT	< 0.75 mA / 240 VAC	I/P : 240 VAC O/P : Min LOAD Ta : 25°C	L-FG : 0.26 mA N-FG : 0.24 mA	P
8	NO LOAD CONSUMPTION	< 0.5 W	I/P : 230VAC O/P : NO LOAD Ta : 25°C	< 0.38 W	P

**PROTECTION FUNCTION TEST**

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	OVER LOAD PROTECTION	105 % ~ 135 %	I/P : 230 VAC I/P : 115 VAC O/P : TESTING Ta : 25°C	113 %/ 230 VAC 126 %/ 115 VAC Hiccup Mode	P
2	OVER VOLTAGE PROTECTION	CH1 : 15.75V ~ 20.25 V	I/P : 230 VAC I/P : 115 VAC O/P : MIN LOAD Ta : 25°C	19.1V/ 230 VAC 19.1V/ 115 VAC Shut down Re- power ON	P
3	OVER TEMPERATURE PROTECTION	SPEC : RTH2>100 °C O.T.P. NO DAMAGE	I/P : 230 VAC O/P : FULL LOAD	O.T.P. Active Shut down Re-power ON	P
4	SHORT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE	I/P : 264 VAC O/P : FULL LOAD Ta : 25°C	NO DAMAGE Hiccup Mode	P

**COMPONENT STRESS TEST**

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	Power Transistor ( D to S) or (C to E) Peak Voltage	Q3 Rated : SPA11N65C3 11A/650V	I/P : High-Line +3V = 267 V O/P : (1)Full Load Turn on (2) Output Short (3)Full load continue Ta : 25°C	(1) 580 V (2) 424 V (3) 576 V	P
2	Diode Peak Voltage	Q101 Rated : STP80NF12 80A/120V	I/P : High-Line +3V = 267 V O/P : (1)Full Load Turn on (2)Output Short (3)Full load continue Ta : 25°C	(1) 120 V (2) 120 V (3) 87.6 V	P
3	Input Capacitor Voltage	C5 Rated : 120u/400V 105°C 18*31.5 VZ	I/P : High-Line +3V = 267 V O/P : (1)Full Load Turn on /Off (2) Min load Turn on /Off (3)Full Load /Min load Change Ta : 25°C	(1) 384.1 V (2) 373.3 V (3) 373.5 V	P
4	Control IC Voltage Test	U1 Rated : TEA1791T 8.85V~38V	I/P : High-Line +3V = 267 V O/P : (1)Full Load Turn on /Off (2) Min load Turn on /Off (3)Full Load /Min load Change Ta : 25°C	(1) 17.598 V (2) 16.256 V (3) 16.257 V	P
5	Power Transistor ( D to S) or (C to E) Peak Voltage	Q 1 Rated : IRFB20N50K 20A/500V	I/P : High-Line +3V = 267 V O/P : (1)Full Load Turn on (2) Output Short (3)Full load continue Ta : 25°C	(1) 448 V (2) 370 V (3) 424 V	P

**SAFETY & E.M.C. TEST**
**SAFETY TEST**

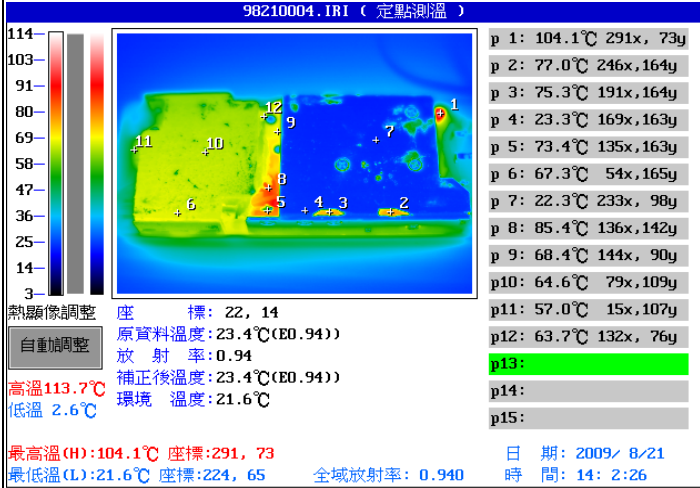
NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	WITHSTAND VOLTAGE	I/P-O/P : 3 KVAC/min	I/P-O/P : 3.6 KVAC/min Ta : 25°C	I/P-O/P : 4.82 mA NO DAMAGE	P
2	ISOLATION RESISTANCE	I/P-O/P : 500VDC>100MΩ	I/P-O/P : 500 VDC Ta : 25°C / 70%RH	I/P-O/P : 30 GΩ NO DAMAGE	P
3	GROUNDING CONTINUITY	FG(PE) TO CHASSIS OR TRACE < 100 mΩ	40 A / 2min Ta : 25°C / 70%RH	9 mΩ	P
4	APPROVAL	TUV : Certificate NO : S50185150 UL : File NO :			P

**E.M.C TEST**

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	HARMONIC	EN61000-3-2 CLASS A CLASS D	I/P : 230 / 220/240VAC/50HZ O/P : 100/75/50/25% LOAD Ta : 25°C	PASS	P
2	CONDUCTION	EN55022 CLASS B	I/P : 230 VAC (50HZ) O/P : FULL/50% LOAD Ta : 25°C	PASS Test by certified Lab	P
3	RADIATION	EN55022 EN61204-3 CLASS B	I/P : 230 VAC (50HZ) O/P : FULL LOAD Ta : 25°C	PASS Test by certified Lab	P
4	E.S.D	EN61000-4-2 LIGHT INDUSTRY AIR : 8KV / Contact : 4KV	I/P : 230 VAC/50HZ O/P : FULL LOAD Ta : 25°C	CRITERIA A	P
5	E.F.T	EN61000-4-4 LIGHT INDUSTRY INPUT : 1KV	I/P : 230 VAC/50HZ O/P : FULL LOAD Ta : 25°C	CRITERIA A	P
6	SURGE	IEC61000-4-5 LIGHT INDUSTRY L-N : 1KV	I/P : 230 VAC/50HZ O/P : FULL LOAD Ta : 25°C	CRITERIA A	P
7	Test by certified Lab & Test Report Prepare				

## RELIABILITY TEST

### ENVIRONMENT TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT																																																																																														
1.	THERMO TRACER TEST (ROOM AMBIENT)	MODEL:GS120A24 TEST CONDITION: 90V FULL LOAD TA=23°C  <p>98210004 . IRI ( 定點測溫 )</p> <p>座標: 22, 14            原資料溫度: 23.4°C (EO.94)            放射率: 0.94            補正後溫度: 23.4°C (EO.94)            高溫 113.7°C            低溫 2.6°C</p> <p>最高溫(H):104.1°C 座標:291, 73            最低溫(L):21.6°C 座標:224, 65 全域放射率: 0.940</p> <p>日期: 2009/ 8/21            時間: 14: 2:26</p>	p 1: 104.1°C 291x, 73y p 2: 77.0°C 246x, 164y p 3: 75.3°C 191x, 164y p 4: 23.3°C 169x, 163y p 5: 73.4°C 135x, 163y p 6: 67.3°C 54x, 165y p 7: 22.3°C 233x, 98y p 8: 85.4°C 136x, 142y p 9: 68.4°C 144x, 90y p10: 64.6°C 79x, 109y p11: 57.0°C 15x, 107y p12: 63.7°C 132x, 76y p13: p14: p15:	<table border="1"> <thead> <tr> <th>Position</th> <th>Temp</th> </tr> </thead> <tbody> <tr><td>1</td><td>RTH1 104.5</td></tr> <tr><td>2</td><td>BD1 77</td></tr> <tr><td>3</td><td>Q1 75.3</td></tr> <tr><td>4</td><td>D1 23.3</td></tr> <tr><td>5</td><td>Q3 73.4</td></tr> <tr><td>6</td><td>Q101 67.3</td></tr> <tr><td>7</td><td>L3 22.3</td></tr> <tr><td>8</td><td>D2 85.4</td></tr> <tr><td>9</td><td>C5 85.4</td></tr> <tr><td>10</td><td>T1 64.6</td></tr> <tr><td>11</td><td>LF-100 57</td></tr> <tr><td>12</td><td></td></tr> <tr><td>13</td><td></td></tr> <tr><td>14</td><td></td></tr> <tr><td>15</td><td></td></tr> <tr><td>16</td><td></td></tr> </tbody> </table>	Position	Temp	1	RTH1 104.5	2	BD1 77	3	Q1 75.3	4	D1 23.3	5	Q3 73.4	6	Q101 67.3	7	L3 22.3	8	D2 85.4	9	C5 85.4	10	T1 64.6	11	LF-100 57	12		13		14		15		16		P																																																												
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2	TEMPERATURE RISE TEST	MODEL : GS120A12 1. ROOM AMBIENT BURN-IN : 1.5 HRS I/P : 230VAC O/P : FULL LOAD Ta= 31.1 °C 2. HIGH AMBIENT BURN-IN : 21 HRS I/P : 230VAC O/P : FULL LOAD Ta= 50.9 °C	<table border="1"> <thead> <tr> <th>NO</th> <th>Position</th> <th>P/N</th> <th>ROOM AMBIENT Ta= 31.1 °C</th> <th>HIGH AMBIENT Ta= 50.9 °C</th> </tr> </thead> <tbody> <tr><td>1</td><td>LF1</td><td>TR962</td><td>65.5°C</td><td>81.5°C</td></tr> <tr><td>2</td><td>LF2</td><td>TR781-R2</td><td>66.5°C</td><td>83.0°C</td></tr> <tr><td>3</td><td>C11</td><td>474/450V 10% P=10 MMX</td><td>71.6°C</td><td>88.6°C</td></tr> <tr><td>4</td><td>BD1</td><td>4A/800V GBU408</td><td>70.4°C</td><td>86.7°C</td></tr> <tr><td>5</td><td>D5</td><td>3A/600V 1N5406</td><td>75.9°C</td><td>92.4°C</td></tr> <tr><td>6</td><td>C5</td><td>120u/420V 105°C PT</td><td>77.4°C</td><td>93.5°C</td></tr> <tr><td>7</td><td>Q1</td><td>IRFB20N50K 20A/500V TO220</td><td>76.8°C</td><td>92.7°C</td></tr> <tr><td>8</td><td>D2</td><td>2A/800V GP20K</td><td>98.2°C</td><td>118.0°C</td></tr> <tr><td>9</td><td>Q3</td><td>SPA11N65C3 11A/650V</td><td>83.6°C</td><td>100.5°C</td></tr> <tr><td>10</td><td>C41</td><td>82u/35V L5kh KY</td><td>83.1°C</td><td>99.1°C</td></tr> <tr><td>11</td><td>C42</td><td>22u/50V UL10Kh YXM</td><td>86.1°C</td><td>102.3°C</td></tr> <tr><td>12</td><td>U1</td><td>PFC FAN6921MR</td><td>77.4°C</td><td>91.8°C</td></tr> <tr><td>13</td><td>RTH2</td><td>NTC 100KΩ 3Φ TTC3A104F4193EY 1%</td><td>81.1°C</td><td>97.2°C</td></tr> <tr><td>14</td><td>L1</td><td>TR623-R3</td><td>73.4°C</td><td>89.9°C</td></tr> <tr><td>15</td><td>L3</td><td>TF2125</td><td>74.0°C</td><td>90.3°C</td></tr> <tr><td>16</td><td>T1</td><td>TF2128</td><td>95.3°C</td><td>111.0°C</td></tr> <tr><td>17</td><td>Q101</td><td>IRFB3607PBF 80A/75V</td><td>82.9°C</td><td>99.3°C</td></tr> <tr><td>18</td><td>CASE</td><td>UP CASE</td><td>89.4°C</td><td>75.9°C</td></tr> </tbody> </table>	NO	Position	P/N	ROOM AMBIENT Ta= 31.1 °C	HIGH AMBIENT Ta= 50.9 °C	1	LF1	TR962	65.5°C	81.5°C	2	LF2	TR781-R2	66.5°C	83.0°C	3	C11	474/450V 10% P=10 MMX	71.6°C	88.6°C	4	BD1	4A/800V GBU408	70.4°C	86.7°C	5	D5	3A/600V 1N5406	75.9°C	92.4°C	6	C5	120u/420V 105°C PT	77.4°C	93.5°C	7	Q1	IRFB20N50K 20A/500V TO220	76.8°C	92.7°C	8	D2	2A/800V GP20K	98.2°C	118.0°C	9	Q3	SPA11N65C3 11A/650V	83.6°C	100.5°C	10	C41	82u/35V L5kh KY	83.1°C	99.1°C	11	C42	22u/50V UL10Kh YXM	86.1°C	102.3°C	12	U1	PFC FAN6921MR	77.4°C	91.8°C	13	RTH2	NTC 100KΩ 3Φ TTC3A104F4193EY 1%	81.1°C	97.2°C	14	L1	TR623-R3	73.4°C	89.9°C	15	L3	TF2125	74.0°C	90.3°C	16	T1	TF2128	95.3°C	111.0°C	17	Q101	IRFB3607PBF 80A/75V	82.9°C	99.3°C	18	CASE	UP CASE	89.4°C	75.9°C	P
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3	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR (MIN)	I/P : 230 VAC O/P : 108 % LOAD Ta : 25°C	TEST : OK	P																																																																																														

4	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P : 264VAC/100VAC O/P : 100 % LOAD Ta= -30 °C	TEST : OK	P
5	HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST	AFTER 12 HOURS IN CHAMBER ON CONTROL 45 °C NO DAMAGE	I/P : 272 VAC O/P : FULL LOAD Ta= 45 °C HUMIDITY= 95 %R.H	TEST : OK	P
6	TEMPERATURE COEFFICIENT	± 0.03 %(0-50°C)	I/P : 230 VAC O/P : FULL LOAD	± 0.015 %(0-50°C)	P
7	STORAGE TEMPERATURE TEST	1. Thermal shock Temperature : -45°C~ +90°C 2. Temperature change rate : 25°C / MIN 3. Dwell time low and high temperature : 30 MIN/EACH 4. Total test cycle : 5 CYCLE 5. Input/Output condition : STATIC		OK	P
8.	THERMAL SHOCK TEST	1. Thermal shock Temperature : -35 °C~ +50°C 2. Temperature change rate : 25°C / MIN 3. Dwell time low and high temperature : 30 MIN/EACH 4. Total test cycle : 10 CYCLE 5. Input/Output condition : 230VAC/Full Load AC ON/OFF TEST turn on 58sec ; turn off 2sec		OK	P
9	VIBRATION TEST	1 Carton & 1 Set (1) Waveform : Sine Wave (2) Frequency : 10-500Hz (3) Sweep Time : 12min/sweep cycle (4) Acceleration : 2G (5) Test Time : 60min in each axis (X.Y.Z) (6) Ta : 25°C		TEST : OK	P
10	CAPACITOR LIFE CYCLE	SUPPOSE C105 IS THE MOST CRITICAL COMPONENT (1) I/P : 230VAC O/P : FULL LOAD Ta= 25 °C LIFE TIME (2) I/P : 230VAC O/P : FULL LOAD Ta= 50 °C LIFE TIME (3) I/P : 230VAC O/P : 75% LOAD Ta= 50 °C LIFE TIME		(1) 41493.6 HRS (2) 10281.6 HRS (3) 26560.8 HRS	P
11	MTBF	MIL-HDBK-217F NOTICES2 PARTS COUNT TOTAL FAILURE RATE : 400.7K HRS			P

DATE	SAMPLE	TEST RESULT	TESTER	APPROVAL
2010/4/18	RD SAMPLE	PASS	SANFORD SU	VINCENT TSENG
2010/6/5	PRODUCT SAMPLE	PASS	SANFORD SU	VINCENT TSENG

2009/08/04 A50-F023